

REMARKS

Claims 17-34 and 56 are pending in the application. By this Amendment, claims 57-66 are newly presented. Applicant requests reconsideration and allowance in view of the following remarks.

Improper Finality of Outstanding Office Action

As an initial matter, Applicant notes that the present Office Action was not properly made Final. In particular, the Examiner asserts that Applicant's previous amendments necessitated the new grounds of rejection; Applicant respectfully refutes that notion.

The previous amendments were entered strictly to obviate certain issues and §112/¶2 rejections the Examiner raised regarding language used in the claims, which issues stemmed from incorrect and/or inconsistent analysis by the Examiner as to whether certain elements were means-plus-function elements and from oversight by the Examiner of relevant supporting disclosure in the specification. See pages 7 and 8 of the June 15, 2009, Amendment and Response. Substantively, however, the claims recite the exact same concepts after amendment as before: the welding area is illuminated with ultraviolet radiation; means for reproducing the welding area (e.g., a camera) views the so-illuminated welding area through a band-pass filter that filters around the particular ultraviolet wavelength; a CPU-based device (e.g., a computer with appropriate software or other programming/code ("image-analyzing means") on it) analyzes the reproduced image of the welding area; and a controller (previously recited as "means") controls at least one welding parameter/the position of the welding head based on that analysis of the reproduced image.

With respect to the art-based rejections, on the other hand, Applicant traversed the rejections not by relying on the as-amended terminology, but rather by explaining to the Examiner that the references being relied upon to support the rejections do not, in fact, show the same fundamental concepts recited in the claims (either before or after the amendments). In particular, Applicant explained that the apparatus disclosed in the Maram reference (the primary reference on which the Examiner was relying) simply monitors where a reflected beam of light strikes a photo-position detector and "watches" to see when that position changes by a

predetermined amount, which signals complete penetration of the weld through the workpiece, instead of analyzing a reproduction image of the welding area. In fact, as Applicant further explained, Maram actually emphasizes focusing on the strike-position of the reflected beam of light to the apparent exclusion of any other information. See pages 9-10 of the June 15, 2009, Amendment. (The secondary, Kovacevic reference did not remedy that deficiency of Maram as a reference.) Thus it was the Examiner's error in asserting that Maram discloses the fundamental concepts expressed in the claims – either pre-amendment or post-amendment – that necessitated the new grounds of rejection (which are still deficient, as addressed below), not Applicant's amendments at all. **Accordingly, the finality of the outstanding Office Action was improper, and Applicant requests that it be withdrawn so that the present amendments (only adding new dependent claims) can be entered.**

Timeliness/Protracted Prosecution

As another preliminary matter, Applicant notes that the present Office Action – which was mailed over five months after Applicant filed their June 15 Amendment and Response to the preceding Non-Final Office Action – is the sixth Office Action (and the second Final Office Action) to have been issued so far in this application, which application was filed on October 5, 2004. In that regard, M.P.E.P. § 707.02 instructs as follows(emphasis added):

707.02 Applications Up for Third Action and 5-Year Applications[R-2]

The supervisory patent examiners should impress their assistants with the fact that the shortest path to the final disposition of an application is by finding the best references on the first search and **carefully** applying them.

The supervisory patent examiners are expected to personally check on the pendency of every application which is up for the third or subsequent *>Office<action **with a view to finally concluding its prosecution.**

Any application that has been pending five years should be **carefully studied** by the supervisory patent examiner and **every effort >should be< made to terminate its prosecution.** In order to accomplish this result, the application is to be considered “special” by the examiner.

Given the number of Office Actions that have been issued in this case; the delay in issuing the latest Office Action; and the length of time this application has been pending, **Applicant respectfully requests that the Supervisory Patent Examiner closely and carefully monitor or review any further, non-allowance action the Examiner responsible for this application takes.** (This request is especially emphatic with respect to the improper finality of the outstanding Office Action.)

Specification Amendments

Applicant notes that various amendments to the specification are presented above, which amendments are intended to buttress the support already present in the application for the dependent claims that are being added by this Amendment and Response. That support can be found, for example, in the figures and/or in the written description at paragraphs [0034] and [0038] (direct view through the welding arc and into the weld melt) and paragraphs [0036], [0049], [0050], and [0057] (obliquely angled view of the weld melt). Therefore, no new matter is presented by these amendments, and Applicant respectfully requests that they be withdrawn.

Art-Based Rejections

Claims 17-26 and 31-34 are rejected under 35 U.S.C. § 103(a) based on Richardson, U.S. 4,943,702, in view of Kovacevic et al., U.S. 5,481,085. According to the Office Action, Richardson discloses all claim elements except for illuminating the welding area with ultraviolet radiation. However, according to the Office Action, Kovacevic discloses that feature such that the claimed invention would have been obvious. Applicant traverses the rejection because the proffered combination of references does not, in fact, yield the claimed invention.

In particular, Richardson does not disclose illumination of the welding area using ultraviolet radiation or a band-pass filter that filters around an ultraviolet wavelength. Rather, in the referenced embodiment shown in Figure 37, the laser 1576 is a helium-neon laser (column 103, lines 58-60); the filter 1592 filters around light at the frequency of the helium-neon laser (column 104, lines 17-19); and a helium-neon laser produces light in the red portion of the spectrum, not the ultraviolet portion. See, for example,

http://en.wikipedia.org/wiki/Helium%E2%80%93neon_laser (“A helium-neon laser, usually called a HeNe laser, is a type of small gas laser. HeNe lasers have many industrial and scientific uses, and are often used in laboratory demonstrations of optics. Its usual operation wavelength is 632.8 nm, in the red portion of the visible spectrum.”).

Furthermore, while Richardson does state at column 10, lines 28-40 that “[t]he term ‘light’ is used herein to mean electromagnetic radiation of a wavelength which can be handled by optical devices such as lenses and cameras, and thus includes not only the spectrum visible to the human eye but also portions of the infrared and ultraviolet regions[,]” in relying on that statement to support his assertion that Richardson discloses an ultraviolet light-producing laser, the Examiner has taken the statement completely out of context. In particular, the reference to light including ultraviolet regions of the spectrum immediately follows the introductory statement – the very first sentence in the Detailed Description, in fact – that (emphasis added) “[f]rom the Summary of the Invention above, it will be apparent that all the methods and apparatus of the invention rely upon detection of light from the weld joint preparation, and/or weld pool.” Thus, the relied-upon statement has nothing to do with the wavelength of the laser 1576 or the “pass-through” wavelength of the band-pass filter 1592 disclosed in Figure 37, and it certainly does not negate the fact that Richardson explicitly identifies the laser as a helium-neon laser, which produces red light, and the filter as filtering around such light. Moreover, the only other place where Richardson refers to ultraviolet light at all is at column 12, lines 44-50, where Richardson states that “[a]lthough the image produced in the image plane 27 can be viewed directly by eye (the use of safety glass to protect the eye from ultraviolet light present in the beam 26 [of light from the weld pool 17] is highly desirable), the apparatus 10 is primarily intended to be used with the image in the plane 27 being observed by a camera.” Clearly, then, Richardson is not referring to using an ultraviolet laser or a band-pass filter that filters around ultraviolet wavelengths.

Moreover, while Kovacevic does disclose a laser that “[p]referably . . . produces light in the near-ultraviolet portion of the optical spectrum[]” (column 3, lines 66-67), and the Examiner stated that that is the sole purpose for which he is relying on Kovacevic, Kovacevic does not disclose any band-pass filter at all, whether centered around ultraviolet wavelengths or

otherwise. Rather, as Applicant explained previously (see the November 5, 2008 Amendment and Response), in Kovacevic, the laser light passes through an optical diffuser 16 (e.g., a pane of frosted glass) and then a grid of slits 20, and the corresponding slit pattern that is reflected from the weld pool is evaluated for any deformation that will indicate changes in the shape of the weld pool. Therefore, a band-pass filter is not needed, since just a pattern of lines – not an actual image of the weld pool itself – is being analyzed, and that pattern of lines is created by light that has been optically diffused to begin with.

Thus, the asserted combination of references does not yield the claimed invention, and the Examiner has not established a *prima facie* case of obviousness. Accordingly, Applicant traverses the rejection and requests that it be withdrawn.

Claims 27-30 and 56 are rejected under 35 U.S.C. § 103(a) based on Richardson in view of Kovacevic, and further in view of Justice, et al., U.S. 4,225,771, on which the Examiner relies for disclosure of the specific band-pass filter widths (i.e., size of the range of frequencies that will pass through the filter) recited in those claims. Applicant traverses that rejection for at least the reasons set forth above, since Justice does not remedy the deficiencies of Richardson and Kovacevic as references explained above. (The monochromatic light 10 disclosed in Justice is a thallium iodide lamp, with approximately forty percent of its radiated energy falling within a band that is 100 Å wide and centered about a wavelength of 5370 Å (537 nm); that puts it squarely within the green range of light. See, for example, http://en.wikipedia.org/wiki/Visible_spectrum.) Accordingly, Applicant traverses the rejection and requests that it be withdrawn.

New Claims

New claims 57-66 recite additional features that further distinguish over the applied references.

For example, claims 57 and 62 specify that the reproducing means views the welding area obliquely (either directly as per claims 58 and 63 or via reflection as per claims 59 and 64). Richardson, in contrast, specifically eschews or denigrates viewing the weld pool at an oblique

angle (see column 1, line 59 through column 2, line 12) and discloses instead various embodiments in which the welding operator or a camera obtains a view that looks straight down the axis of the welding head and at the welding area from directly (i.e., 90°) above it. See, for example, Figures 1-3, 35, and 37 of Richardson. Furthermore, given the “problems” Richardson asserts oblique views create (see, for example, column 1, lines 62-66 (“Unfortunately, such an oblique view inherently includes the electric arc, which is very bright and thus tends to “wash out” the entire television picture unless appropriate filters are utilized. Therefore, these prior art methods have required filtering the light reaching the camera so that only light within a narrow band, or of several discrete wavelengths, reaches the camera, rather than allowing the camera to receive light of the broad range of wavelengths emitted by the arc.”)), one of skill in the art would have been disinclined to modify Richardson to use an oblique view as, for example, per Kovacevic or Justice.

Additionally, claims 60 and 65 specify that the welding area is illuminated directly. That is in contrast to Richardson, where the welding area is illuminated by a beam of light that is reflected off of the welding electrode. See, for example, the Richardson Abstract; Figures 35 and 36; and their associated text. (None of the other Richardson embodiments disclose illuminating the welding area.) Thus, those claims, too, are believed to distinguish over Richardson and any proposed combination of references using Richardson.

In view of the foregoing, Applicant submits that all claims are in condition for allowance, and timely Notice to that effect is respectfully requested.

Serial No.: 10/711,786
Confirmation No.: 5785
Applicant: HENRIKSON, Per
Atty. Ref.: 7589.204.PCUS00

The undersigned representative requests any extension of time that may be deemed necessary to further the prosecution of this application.

The undersigned representative authorizes the Commissioner to charge any additional fees under 37 C.F.R. 1.16 or 1.17 that may be required, or credit any overpayment, to Deposit Account No. 14-1437, Order No. 7589.204.PCUS00.

In order to facilitate the resolution of any issues or questions presented by this paper, the Examiner should directly contact the undersigned by phone to further the discussion.

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Respectfully submitted,

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